THE MINERAL INDUSTRY OF

SAUDI ARABIA

By Philip M. Mobbs

The Kingdom of Saudi Arabia maintained its position as the main oil producer in the world and accounted for 11.4% of the world's crude oil production compared with Russia, which produced about 11.1%, and the United States, which accounted for about 8.6% (U.S. Energy Information Administration, 2003b). Saudi Arabia's large annual production volume, excess production capacity, and low local consumption allowed it to be the swing producer of the Organization of the Petroleum Exporting Countries' (OPEC) crude oil price support program.

The Kingdom's population was estimated to be about 24 million. In 2002, the gross domestic product (GDP) based on purchasing-power-parity valuation was estimated to be more than $247 billion.[1] The GDP growth rate was estimated to be 1% compared with 1.4% in 2001 and 4.9% in 2000 (International Monetary Fund, 2003§[2]). Crude oil and natural gas production accounted for about 27% of the 2002 GDP, and petroleum refining accounted for about 3%; about 0.4% was attributed to other mineral production (Saudi Arabian Monetary Agency, 2003§). The Cooperation Council for the Arab States of the Gulf (GCC), which included Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, was to institute a customs union on January 1, 2003. The GCC also continued its efforts to introduce a common currency by 2010.

In 2002, exports of crude oil and petroleum products from Saudi Arabia to the United States were reported to be about 1.55 million barrels per day (Mbbl/d) compared with 1.66 Mbbl/d in 2001. Saudi Arabia was the second leading source of total U.S. crude oil and petroleum product imports and accounted for about 13.5% of imports in 2002 compared with Canada, which was the leading source of U.S. crude oil and petroleum products imports in 2002; its 1.97 Mbbl/d accounted for 17.1% of the total import volume. Mexico was third largest supplier with 1.55 Mbbl/d, and Venezuela, fourth with about 1.4 Mbbl/d (U.S. Energy Information Administration, 2003a).

Production

In addition to petroleum-related minerals, such as carbon black, crude oil, natural gas, refined petroleum products, and sulfur, mineral and mineral-based commodity production in Saudi Arabia included barite, cement, other construction and industrial materials, nitrogenous and phosphatic fertilizers, ferroalloys, granite, base and precious metals, and salt. Steel was produced from scrap and imported iron ore pellets. Titanium dioxide pigment was produced from imported rutile.

In 2002, Saudi Arabian crude oil production again declined. The drop in oil production was attributed to continued reduction in the official OPEC production ceiling allocated to Saudi Arabia. OPEC constrained allowable production to 7.05 Mbbl/d in 2002 compared with a declining range from 8.67 Mbbl/d at the beginning of the year to 7.54 Mbbl/d at the end of 2001 (Organization of the Petroleum Exporting Countries, 2003, p. xi). Actual sustainable production capacity ranged from about 10.0 to 10.5 Mbbl/d (Mably, 2003§; U.S. Energy Information Administration, 2003§).

Structure of the Mineral Industry

All minerals and mineral fuels were owned by the Government. The state-owned Saudi Arabian Mining Co. (Ma'aden) participated in and promoted mineral exploration and mining activities throughout the Kingdom. In 2002, Saudi Arabian Oil Co. (Saudi Aramco) and its subsidiaries were the only companies authorized to engage in oil and gas exploration and field development within Saudi Arabia, although the Gas Initiative Project, which was under negotiation, was expected to allow consortia of multinational oil companies into the natural gas exploration and production arena. Many industrial projects in the petrochemical and petroleum-refining sectors were joint ventures between Saudi firms and international companies.

Commodity Review

Metals

In 2002, much of Saudi Arabia's metal ore production was from the underground Mahd Adh Dhahab Mine where Ma'aden produced gold and silver bullion and a bulk concentrate that contained copper, gold, lead, silver, and zinc. The mine is expected to close in 2005 (MENAFN.COM, 2003§). Ma'aden, which the Government proposed to privatize, also managed development operations at the underground Al-Amar and the open pit Al-Hajar gold mines. The loss of Mahd Adh Dhahab's base–metal concentrates was expected to be offset eventually by base–metal production from the Al-Amar Mine. Saudi Company for Precious

[1]Where necessary, values have been converted from Saudi riyals (SR1s) to U.S. dollars at the rate of SR1s3.75=US1.00.
[2]References that include a section mark (§) are found in the Internet References Cited section.

Metals (a subsidiary of Ma'aden) operated the Sukhaybirat open pit gold mine and started operations at the open pit Bulghah gold mine in October. Heap-leach operations at Sukhaybarat were expected to end in 2003, but the mine's carbon-in-leach facilities were expected to continue to process stockpiled ore and to handle carbon shipped 70 kilometers (km) from the Bulghah Mine (Saudi Arabian Mining Co., undated a§-d§).

Iron and Steel.—The Al-Rajhi Steel Industries factory of Al-Rajhi Co. for Industry and Trade installed a 150,000-metric-ton-per-year (t/yr)-capacity cold-rolling mill. Mill feed was to be sourced from Saudi Iron & Steel Co. (Hadeed). Al-Rajhi also conducted a feasibility study on the construction of a 1-million-metric-ton-per-year (Mt/yr) steel meltshop in Riyadh (Metal Bulletin, 2003). Hadeed planned to expand the flat products production capacity at its Al-Jubayl plant to 2 Mt/yr from 850,000 t/yr (Al-Jabr, undated§).

Tantalum.—In January 2002, Tertiary Minerals plc of the United Kingdom acquired a 5-year exploration license on the Ghurayyah tantalum deposit, which is about 85 km southwest of Tabuk. In December, the company commissioned a scoping study on the deposit, which was estimated to contain resources of 385 million metric tons (Mt) of ore with an average grade of 245 grams per metric ton (g/t) tantalum pentoxide (Ta_2O_5), 2,840 g/t niobium pentoxide, and 8,915 g/t zircon oxide. The relative size of the 900-meter granite plug at Ghurayyah becomes apparent when compared with the measured reserves and estimated resources of the Abu Dabbab project, which was under evaluation in Egypt (40 Mt with an average grade of 251 g/t Ta_2O_5), and the world's two largest hard rock tantalum mines in Australia—Greenbushes (220 Mt with an average grade of 221 g/t Ta_2O_5) and Wodgina (about 87 Mt with an average grade of 316 g/t Ta_2O_5) (Gippsland Ltd., 2002; Mining Journal, 2002; Sons of Gwalia Ltd., undated a§, b§).

Zinc.—ZincOx Resources plc of the United Kingdom pursued plans to build a 100,000-t/yr zinc plant in Yanbu. The company had completed a prefeasibility study in 2001 and began a 15-month feasibility study in January 2002. In December, the proposed plant was approved by British Offset, which represented United Kingdom's interests in the Al Yamamah Economic Offset program. A projected source of zinc ore was ZincOx's proposed mine at Jabali, Yemen (ZincOx Resources plc, 2002, 2003).

On July 19, 2000, the Arabian Shield Development Co. of the United States changed its name to the Arabian American Development Co.; the operating company in Saudi Arabia retained the Arabian Shield Development Co.'s name. In March 2002, Arabian American was notified by the Ministry of Petroleum and Mineral Resources that the Ministry considered that the company had failed to implement a work program on the Al Masane zinc prospect. The company held a mining lease on the property that did not expire until 2023. Attempts in the 1990s to obtain a viable joint-venture partner to develop the property were unsuccessful. In 1999, Arabian Shield had notified the Ministry that it intended to defer the Al Masane project until zinc prices improved; in 2000 and again in 2001, however, the Ministry requested that implementation of the project begin immediately or the mining lease would be terminated. Arabian American was attempting to resolve the situation satisfactorily (Arabian American Development Co., 2002).

Industrial Minerals

Magnesium.—Gulf Das Co. was reported to have received permission from the Saudi Arabian General Investment Authority to build a $213 million plant in Dammam. Planned production capacity of the plant was 20,000 t/yr of magnesium and 48,000 t/yr of potassium chloride (Saudi Arabian Information Resource, 2002§).

Nitrogen.—Saudi Arabian Fertilizers Co. (SAFCO) [a joint stock company in which the Saudi Basic Industries Corp. (SABIC) held a 43% equity interest] proposed a 91-metric-ton-per-day (t/d) expansion of the no. 2 ammonia plant and a 126-t/d expansion of the no. 2 urea plant at Al-Jubayl. SAFCO also requested bids on the construction of a 1.07-Mt/yr urea plant and 990,000-t/yr-capacity ammonia plant at Al-Jubayl (plant no. 4). The estimated $400 million plant no. 4 was tentatively scheduled to be operational in 2005 (Asian Chemical News, 2002b; Middle East Economic Digest, 2002).

Sulfur.—In May, Saudi Aramco awarded a contract to build two 70-t/d sulfur recovery units at the Riyadh refinery (Oil & Gas Journal, 2002). The units were expected to be operational in April 2004.

Mineral Fuels

Methanol.—Saudi Methanol Co. (Ar-Razi) (a subsidiary of the Mitshubishi Gas Chemical Co. Inc. of Japan and SABIC) evaluated the addition of a 1.65-Mt/yr methanol train to its existing four-line, 2.9-Mt/yr facility at Al-Jubayl. The proposed line could be completed in 2004. Ar-Razi also expected to increase capacity with planned modifications to methanol trains II, III, and IV (Asian Chemical News, 2002a).

Natural Gas.—The initial agreements for the Gas Initiative Project were signed in 2001. The negotiations that continued during 2002 between the Government and the consortia were unable to reach an satisfactory conclusion. The consortia included BP plc, Exxon Mobil, Phillips Petroleum Co., and the Royal Dutch/Shell Group for the development of Core Venture I–the Haradh (South Ghawar Area) project; Exxon Mobil Corp., Marathon Oil Corp., and Occidental Petroleum Corp. for the development of Core Venture II–the Rabigh/Midyan (Red Sea Area) project; and Conoco Inc., Total S.A. (formerly the TotalFinaElf Group), and Royal Dutch/Shell for the development of Core Venture III–the Kidan/Shaybah project.

Additional information on the oil and gas sector in Saudi Arabia, is provided in the U.S. Energy Information Administration's (2003§) June 2003 Saudi Arabia Country Analysis Brief.

Reserves

Saudi Arabian Oil Co. (2003§) reported that the country's crude oil reserves were 259.4 billion barrels. This represented about 25% of the total proven world reserves compared with Iraq (10.7% of world crude oil reserves), the United Arab Emirates (9.3%), Kuwait (9.2%), Iran (8.5%), Trinidad and Tobago (7.4%), Russia (5.7%), and the United States (2.9%) (BP plc, 2003§). The bulk of the Kingdom's reserves were contained in a few fields in the northeast, especially the onshore Ghawar Field and the offshore Safaniya Field.

Most of Saudi Arabian natural gas reserves were associated with the country's oilfields. The Ghawar Field accounted for about 35% of the total gas reserves, which were reported to be about 6.4 trillion cubic meters (Saudi Arabian Oil Co., 2003, p. 41).

Outlook

Despite diversification efforts, most of the Saudi Arabian income remained dependent upon the international oil markets. The Kingdom's economy remained vulnerable to sudden changes in volume and pattern of worldwide trade in crude oil, petrochemicals, and refined petroleum, which were exacerbated by the country's variable production as OPEC's swing producer. Cement and clinker exports from Saudi Arabia have grown in recent years and are expected to continue to increase.

References Cited

Arabian American Development Co., 2002, Form 8-K—December 23: U.S. Securities and Exchange Commission, 5 p.
Asian Chemical News, 2002a, Ar-Razi studying No5 methanol: Asian Chemical News, v. 8, no. 363, July 1, p. 25.
Asian Chemical News, 2002b, New projects summary as reported in ACN 7-13 October 2002: Asian Chemical News, v. 375, no. 8, October 14, p. 20.
Gippsland Ltd., 2002, Abu Dabbab tantalite project: Nedlands, Australia, Gippsland Ltd., July, 6 p.
Metal Bulletin, 2003, Al-Rajhi to install 1M tpy meltshop: Metal Bulletin, no. 8756, March 13, p. 19.
Middle East Economic Digest, 2002, Four bid for Safco expansion: Middle East Economic Digest, v. 46, no. 40, October 4, p. 16.
Mining Journal, 2002, Scoping study for Saudi tantalum: Mining Journal, v. 339, no. 8714, December 6, p. 400.
Oil & Gas Journal, 2002, Saudi Arabian Oil Co.: Oil & Gas Journal, v. 100, no. 21, May 27, p. 9.
Organization of the Petroleum Exporting Countries, 2003, Annual statistical bulletin: Vienna, Austria, Organization of the Petroleum Exporting Countries, 132 p.
Saudi Arabian Oil Co., 2003, Saudi Aramco 2002—Facts and figures: Dhahran, Saudi Arabia, Saudi Arabian Oil Co., 42 p.
U.S. Energy Information Administration, 2003a, Table 3.3—Petroleum imports from: U.S. Energy Information Administration Monthly Energy Review, August, p. 48-55.
U.S. Energy Information Administration, 2003b, Table 11.1—World crude oil production: U.S. Energy Information Administration Monthly Energy Review, August, p. 148-149.
ZincOx Resources plc, 2002, Annual report—2001: Bagshot, United Kingdom, ZincOx Resources plc, June, 28 p.
ZincOx Resources plc, 2003, Annual report—2002: Bagshot, United Kingdom, ZincOx Resources plc, June, 36 p.

Internet References Cited

Al-Jabr, [undated], Hadeed's achievements during the past years are objects of pride for all Hadeed employees, President's Message, accessed October 23, 2003, at URL http://www.hadeed.com.sa/ehadeed/Corp/Pmessage.htm.
BP plc, 2003, Oil-proved reserves, BP Statistical Review of World Energy 2003, accessed June 10, 2003, via URL http://www.bp.com/files/16/bp_stats_history_1611.xls.
International Monetary Fund, 2003 (September), World economic outlook database, accessed September 26, 2003, via URL http://www.imf.org/external/pubs/ft/weo/2003/02/data/dbginim.cfm.
Mably, Richard, 2003 (January 13), Saudi can pump 10 mbpd in two weeks-Gulf official, OPEC Newsroom, accessed January 13, 2003, at URL http://www.zawya.com/printstory.cfm?storyid=104235849nL11453705&Section=Industries&page=Oil%20%26%20Gas&l=030113.
MENAFN.COM, 2003 (March 4), Maaden to close largest gold mine in Saudi by 2005, accessed March 6, 2003, at URL http://www.menafn.com/qn_print.asp?StoryID=14987&Subl=true.
Saudi Arabian Information Resource, 2002 (August 6), Investment in $213 million plant to produce magnesium, accessed August 12, 2002, at URL http://www.saudinf.com/main/y4422.htm.
Saudi Arabian Mining Co., [undated] a, Al-Amar Mine, accessed July 25, 2003, at URL http://www.maden.com.sa/projects-amar.html.
Saudi Arabian Mining Co., [undated] b, Al-Hajar Mine, accessed July 25, 2003, at URL http://www.maden.com.sa/projects-hajar.html.
Saudi Arabian Mining Co., [undated] c, Al-Sukhaybarat Mine, accessed July 25, 2003, at URL http://www.maden.com.sa/projects-bolgh.html.
Saudi Arabian Mining Co., [undated] d, Bulghah Mine, accessed July 25, 2003, at URL http://www.maden.com.sa/projects-shok.html.
Saudi Arabian Monetary Agency, 2003, Gross domestic product by type of economic activity, Statistical Table—National Account Statistics—Gross Domestic Product—Producers' Values & Current Prices 4, accessed October 20, 2003, via http://www.sama.gov.sa/reports/annual/default.htm.
Sons of Gwalia Ltd., [undated] a, Greenbushes—Advanced Mineral Division, accessed October 22, 2003, at URL http://www1.sog.com.au/pages/amd_greenbushes.asp.
Sons of Gwalia Ltd., [undated] b, Wodgina—Advanced Mineral Division, accessed October 22, 2003, at URL http://www1.sog.com.au/pages/amd_wodgina.asp.
U.S. Energy Information Administration, 2003 (June), Saudi Arabia, Country Analysis Brief, accessed October 20, 2003, at URL http://www.eia.doe.gov/emeu/cabs/saudi.html.

Major Sources of Information

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Major Publications

Arab Petroleum Research Center. Arab Oil & Gas Directory, annual
Saudi Arabia Directorate General of Mineral Resources:
Atlas of Industrial Minerals, 1993.
Mineral Resources of Saudi Arabia, 1994.

TABLE 1
SAUDI ARABIA: PRODUCTION OF MINERAL COMMODITIES [1]

(Metric tons unless otherwise specified)

Commodity [2]		1998	1999	2000	2001	2002 [e]
METALS						
Ore, mine output:						
Gross weight [e]		1,700,000	1,680,000	1,700,000	2,000,000	2,000,000
Copper content of concentrate and bullion [3]		782	821	900 [e]	800 [e]	800
Gold content of concentrate and bullion [3]	kilograms	5,100	4,570	3,800 [e]	5,000 [e]	5,000
Lead content of concentrate [e, 3]		60	50	50	60	60
Silver content of concentrate and bullion [3]	kilograms	13,840	10,470	9,300 [e]	15,000 [e]	14,000
Zinc content of concentrate [3]		3,550	3,161	3,000 [e]	3,300 [e]	3,000
Iron and steel:						
Direct-reduced iron	thousand tons	2,268	2,343	3,090	2,880	3,290
Steel, crude	do.	2,356	2,610	2,973	3,413 [r]	3,800
Ferroalloys [e]		83,000	83,000	83,000	78,000	75,000
INDUSTRIAL MINERALS						
Barite [e]		8,000	7,000	8,000	9,000	9,000
Cement, hydraulic	thousand tons	15,786	16,313	18,107	20,608	22,000
Fertilizer, phosphatic, P_2O_5 content	do.	130	145	147 [e]	150 [e]	150
Gypsum, crude [e]		330,000	380,000 [4]	400,000	450,000	450,000
Lime [e]		200,000	340,000 [4]	350,000	350,000	350,000
Nitrogen:						
N content of ammonia	thousand tons	1,418	1,402	1,743	1,774	1,737 [4]
N content of urea	do.	1,024	1,002	1,214	1,260	1,200
Pozzolan [e]		145,000	140,000	150,000	150,000	150,000
Salt [e]		140,000	200,000 [4]	200,000	200,000	200,000
Sand and gravel [e]	thousand tons	100,000	120,000	120,000	120,000	120,000
Scoria [e]	do.	2,000	2,000 [4]	2,000	2,000	2,000
Sulfur, byproduct, hydrocarbon processing		2,050,000	1,939,758	2,101,391	2,350,000 [e]	2,230,000
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross [e]	million cubic meters	83,000	89,000	96,000	91,500	97,000
Dry	do.	48,875 [r]	49,555 [r]	54,623 [r]	58,163 [r]	62,014 [4]
Natural gas liquids: [e]						
Propane	thousand 42-gallon barrels	159,000	153,000	163,000	166,000	179,400
Butane	do.	69,000	66,200	69,000	72,000	78,000
Natural gasoline and other	do.	51,000	50,000	53,000	54,000	58,500
Total	do.	279,163 [4]	269,134 [4]	285,008 [4]	292,385 [4]	316,938 [4]
Petroleum:						
Crude oil	million 42-gallon barrels	3,022 [r]	2,761 [r]	2,962 [r]	2,879 [r]	2,589 [4]
Refinery products:						
Liquefied petroleum gases	thousand 42-gallon barrels	11,929	12,533	9,634	13,230 [r]	10,340
Gasoline and naptha	do.	142,606	148,853	155,556	152,230 [r]	153,240
Jet fuel and kerosene	do.	53,243	60,638	66,920	60,050 [r]	59,700
Distillate fuel oil	do.	193,328	188,848	198,176	193,770 [r]	192,720
Residual fuel oil	do.	176,460	164,032	163,941	169,530 [r]	157,680
Unspecified [5]	do.	6,533	6,625	8,083	8,650	9,180
Total	do.	584,099	581,529	602,310	597,460 [r]	582,860

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised.
[1]Table includes data available through October 24, 2003.
[2]In addition to commodities listed, the following were produced: basalt, carbon black, clays, granite, limestone, marble, methanol, and silica sand; available information is inadequate to estimate output.
[3]Mahd Adh Dhahab Mine produced a concentrate that contains copper, gold, lead, silver, and zinc and a crude bullion that contains copper, gold, and silver.
[4]Reported figure.
[5]Includes asphalt.